TITLES 13 and 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE LOW CARBON FUEL STANDARD REGULATION AND TO THE REGULATION ON COMMERCIALIZATION OF ALTERNATIVE DIESEL FUELS

The California Air Resources Board (CARB or Board) will conduct a public hearing at the time and place noted below to consider proposed amendments to the Low Carbon Fuel Standard (LCFS) and to the Regulation on Commercialization of Alternative Diesel Fuels (ADF).

DATE: April 27, 2018

TIME: 9:00 A.M.

LOCATION: Sacramento County Administration Building
700 H Street
Sacramento, California 95814

This item will be considered at a meeting of the Board, which will commence at 9:00 a.m., April 27, 2018. Please consult the agenda for the hearing, which will be available at least ten days before April 27, 2018, to determine when this item will be considered.

WRITTEN COMMENT PERIOD AND SUBMITTAL OF COMMENTS

Interested members of the public may present comments orally or in writing at the hearing and may provide comments by postal mail or by electronic submittal before the hearing. The public comment period for this regulatory action will begin on March 9, 2018. Written comments not physically submitted at the hearing must be submitted on or after March 9, 2018 and received **no later than 5:00 p.m. on April 23, 2018**. CARB requests that when possible, written and email statements be filed at least ten days before the hearing to give CARB staff and Board members additional time to consider each comment. The Board also encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action. Comments submitted in advance of the hearing must be addressed to one of the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

AUTHORITY AND REFERENCE

This regulatory action is proposed under the authority granted in California Health and Safety Code, sections 38510, 38530, 38560, 38560.5, 38571, 38580, 39600, 39601, 41510, 41511, 43000.5, 43013, 43018, and 43101; 42 U.S.C. section 7545, and *Western Oil and Gas Ass'n v. Orange County Air Pollution Control District*, (1975) 14 Cal.3d 411. This action is proposed to implement, interpret, and make specific Health and Safety Code, sections 38501, 38510, 39515, 39516, 38571, 38580, 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 40000, 41510, 41511, 43000, 43016, 43018, 43026, 43101, 43830.8, and 43865; Public Resources Code, section 25000.5; and *Western Oil and Gas Ass'n v. Orange County Air Pollution Control District*, (1975) 14 Cal.3d 411.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW (GOV. CODE, § 11346.5, subd. (a)(3))

Sections Affected: Proposed amendments to California Code of Regulations, title 17, sections 95480, 95481, 95482, 95483, 95483.1, 95483.2, 95484, 95485, 95486, 95487, 95488, 95489, 95490, 95491, 95492, 95493, 95494, 95495, 95496, and 95497; and proposed amendments to section 2293.6 and Appendix 1 in title 13, chapter 5, article 3, subarticle 2, California Code of Regulations. Proposed adoption of sections 95483.3, 95488.1, 95488.2, 95488.3, 95488.4, 95488.5, 95488.6, 95488.7, 95488.8, 95488.9, 95488.10, 95490, 95491.1, 95498, 95499, 95500, 95501, 95502, and 95503, California Code of Regulations, title 17

Documents Incorporated by Reference (Cal. Code Regs., tit. 1, § 20, subd. (c)(3)):

The following documents and models would be incorporated in the regulation by reference as specified by section:

- ASTM Specification D910-17 (2017), Standard Specification for Leaded Aviation Gasolines, May 1, 2017, section 95481(a)(9)
- California-modified Greenhouse Gases, Regulated Emissions, and Energy use in Transportation version 3.0 (CA-GREET3.0) model, March 6, 2018, sections 95481(a)(20), 95488.3(b)
- ASTM Specification D1655-17 (2017), Standard Specification for Aviation Turbine Fuels, August 1, 2017, section 95481(a)(27)
- Oil Production Greenhouse gas Emissions Estimator Version 2.0, March 6, 2018, section 95481(a)(93)
- ASTM D1835-16 (2016), Standard Specification for Liquefied Petroleum (LP) Gases, October 1, 2016, section 95481(a)(113)
- CA-GREET3.0 Lookup Table Pathways Technical Support Documentation, March 6, 2018, sections 95488.1(b), 95488.5(e)

- Tier 1 Simplified CI Calculator for Starch and Corn-Fiber Ethanol, March 6, 2018, section 95488.3(b)(1)
- Tier 1 Simplified CI Calculator for Sugarcane-derived Ethanol, March 6, 2018, section 95488.3(b)(2)
- Tier 1 Simplified CI Calculator for Biodiesel and Renewable Diesel, March 6, 2018, section 95488.3(b)(3)
- Tier 1 Simplified CI Calculator for LNG and L-CNG from North American Natural Gas, March 6, 2018, section 95488.3(b)(4)
- Tier 1 Simplified CI Calculator for Biomethane from North American Landfills, March 6, 2018, section 95488.3(b)(5)
- Tier 1 Simplified CI Calculator Instruction Manual, March 6, 2018, section 95488.6(a)(1)(B)
- Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard, March 6, 2018, section 95490(a)
- ASTM D1250-08 (2013) e1, Standard Guide for Use of the Petroleum Measurement Tables, ASTM D1250-08, reapproved 2013, sections 95491(d)(1)(B)2.b., 95491(d)(1)(B)3
- American Petroleum Institute (API) Manual of Petroleum Measurement Standards Chapter 11 – Physical Properties Data, May 2004, section 95491(d)(1)(B)3
- API Technical Data Book – Petroleum Refining Chapter 6 – Density (Sixth Edition, April 1997), section 95491(d)(3)(B)3

Background and Effect of the Proposed Regulatory Action:

In 2006, the Legislature passed and then-Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (AB 32; Stats. 2006, ch. 488). In Assembly Bill (AB) 32, the Legislature declared that global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The Legislature further declared that global warming will have detrimental effects on some of California's largest industries, including agriculture and tourism, and will increase the strain on electricity supplies. The Legislature recognized that action taken by California to reduce emissions of greenhouse gases (GHG) will have far-reaching effects by encouraging other states, the federal government, and other countries to act. AB 32 creates a comprehensive, multi-year program to reduce GHG emissions in California, with the overall goal of restoring emissions to 1990 levels by the year 2020. AB 32 required CARB to take actions that included:

- Establishing a statewide GHG emissions cap for 2020, based on 1990 emissions;
- Adopting a scoping plan by January 1, 2009, indicating how emission reductions will be achieved from significant GHG sources via regulations, market mechanisms, and other actions;
- Adopting a list of discrete, early action GHG emission reduction measures by June 30, 2007, which can be implemented and enforced no later than January 1, 2010; and
- Adopting regulations by January 1, 2010, to implement the measures identified on the list of discrete early action measures.

In 2007, then-Governor Schwarzenegger signed Executive Order S-01-07. This executive order directed the CARB to determine whether an LCFS for transportation fuels used in California could be adopted as a discrete early action measure pursuant to AB 32, and if so, to draft the LCFS so that it reduces the carbon intensity of transportation fuels used in California by at least 10 percent by the year 2020. In addition to substantially reducing GHG emissions from transportation fuels, the LCFS is expected to help diversify the transportation fuels market in California, thereby cutting petroleum dependency and creating a sustainable and growing market for cleaner fuels.[1]

In 2007, the Board approved a list of nine discrete early action measures, including a measure entitled, "Low Carbon Fuel Standard." The proposed regulation was designed to implement this measure pursuant to the requirements of AB 32 and Executive Order S-01-07.

The Board approved an LCFS regulation in 2009. The goal of the LCFS regulation was to reduce the carbon intensity of transportation fuels used in California by at least 10 percent by 2020 from a 2010 baseline. CARB approved revisions to the LCFS effective November 26, 2012.

On July 15, 2013, the State of California Court of Appeal (Court) issued its opinion in *POET, LLC v. California Air Resources Board* (2013) 218 Cal.App.4th 681, ruling that the LCFS adopted in 2009 and implemented in 2010 (referred to as 2010 LCFS) would remain in effect, and that CARB could continue to implement and enforce the 2013 regulatory standards while taking steps to address California Environmental Quality Act (CEQA) and Administrative Procedure Act (APA) issues identified in the ruling. To address those issues, CARB must set aside the existing LCFS regulation and re-adopt an LCFS regulation.

To comply with the court ruling, and to update and revise the LCFS regulation, on September 25, 2015, the Board set aside the previous version of the LCFS, and simultaneously adopted a new version of the LCFS. On that same day, the Board also adopted an ADF regulation designed preserve or enhance public health, environmental and emission benefits associated with the use of innovative alternative diesel fuels in California.

In the proposed rulemaking to amend the LCFS regulation in 2018, CARB intends to strengthen to LCFS targets through 2030. In 2016, the California Legislature adopted Senate Bill (SB) 32 (Stats. 2016, ch. 249 (Pavley)), which builds on the progress of AB 32 by codifying a statewide target to reduce GHG emissions by at least 40 percent below 1990 levels by 2030. To encourage additional GHG reductions in strategic areas where decarbonization will be important to meet long-term targets, staff proposes to recognize eligibility of new fuels and vehicle applications for generating credits under the LCFS program. To enhance the integrity of the emission reduction claims in the

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[1] Governor's White Paper, *The Role of a Low Carbon Fuel Standard in Reducing Greenhouse Gas Emissions and Protecting Our Economy*, <http://gov.ca.gov/index.php?/fact-sheet/5155/>.

program, the amendments include a proposal to establish an independent third-party verification and accreditation program for ensuring the accuracy of data reported under LCFS. Finally, the proposed LCFS amendments include a number of changes that would integrate the verification system, update program data, quantification methods and analysis tools, and other changes to improve, streamline, and further clarify application and reporting processes. The targeted amendments to the ADF regulation remove expired provisions, correct transcription errors, and adjust an emissions control sunset provision.

CARB may also consider other changes to the sections affected, as listed on page 2 of this notice, during the course of this rulemaking process.

Objectives and Benefits of the Proposed Regulatory Action:

2019 through 2030 Carbon Intensity Decline

The most significant change under consideration in this rulemaking is how to strengthen the CI reduction targets through 2030 in-line with the SB 32 goals. The proposed amendments target a 20 percent reduction in fuel carbon intensity (CI) from a 2010 baseline by 2030. The amendments also propose smoothing the near-term benchmark schedule by linearly reducing by 1.25 percent annually from a 5 percent reduction in 2018 to the 20 percent value in 2030.

Table 1: Proposed LCFS Schedule for Percentage Reduction in CI

2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
6.25	7.50	8.75	10.00	11.25	12.50	13.75	15.00	16.25	17.50	18.75	20.00

Changes to Fuels Subject to the Regulation

Staff is proposing amendments that would broaden the list of fuels subject to the LCFS regulation and alter the opt-in and/or exempt status of particular fuels. The major potential changes include:

- **The addition of alternative jet fuels (AJF) as opt-in credit-generating fuels:** Including AJF in the LCFS may result in several benefits. First, incorporating AJF would clearly signal California's interest in addressing a significant and growing source of GHG emissions. Currently, GHG emissions from aviation contribute to approximately two percent of the total global emissions and are expected to grow. Second, because AJF and renewable diesel (RD) are often produced in the same facility using the same feedstock, inclusion of AJF may lead to increased investment in facilities, thereby increasing the production of both alternative fuels. The airline industry is developing a strong record for partnering with alternative fuel producers through direct investment and off-take agreements.

- **Removing the opt-in status for fossil compressed natural gas (CNG), hydrogen, and the exemption for propane:** In the current regulation, hydrogen and CNG from fossil natural gas are opt-in fuels because they are presumed to have a CI that meets the benchmarks in every year. Staff is proposing more ambitious CI benchmarks; however, staff anticipates some pathways for these fuels will have a CI that exceeds the benchmarks and become deficit-generating fuels. Liquefied petroleum gas (LPG or "propane"), including renewable propane, is exempt from the current regulation, meaning its use as a transportation fuel generates neither credits nor deficits. Staff is also proposing to include this fuel in the LCFS.

- **Allowing alternative fuels used in military vehicles to opt in:** The LCFS currently exempts all fuels supplied for use in military tactical vehicles and support equipment from both credit and deficit generation. Producers of renewable fuels used in these applications have expressed concern that this provision reduces their incentives to sell low carbon fuels to the military. These producers have requested opt-in status for the alternative fuels sold for use in these military applications. Staff is supportive of this approach because it simplifies the decision-making framework created by the LCFS for low carbon fuel producers.

Carbon Capture and Sequestration Quantification and Permanence Protocol

Carbon Capture and Sequestration (CCS) is a potentially significant technology for reducing CO_2 emissions from large stationary sources. In light of California's mid- and long-term climate goals, CCS is likely to grow in importance. In the 2015 LCFS rulemaking, CARB clarified that CCS projects would be eligible to produce LCFS credits upon the adoption of a Board-approved quantification methodology (QM) and relevant regulatory requirements that ensure sequestration permanence. The proposed amendments in this rulemaking include a fully developed CCS protocol that describes a detailed QM and crediting requirements designed to ensure sequestration permanence.

Promote Zero Emission Vehicle Infrastructure through Renewable Electricity to ZEVs

Staff is proposing amendments that add flexibility for accounting for renewable/low-CI electricity used in zero emission vehicle (ZEV) applications, such as electric vehicle charging and hydrogen production via electrolysis. Electricity is the primary—if not the sole—factor in determining the CI of these fuel pathways and the combination of renewable electricity and ZEVs offers significant opportunity for CI reductions.

However, we have seen very little interest in such pathways under the current rule. Staff believes that the lack of fuel pathways that combine zero carbon electricity and ZEV fueling technology is due to the small geographic footprint of ZEV infrastructure—which is often located in dense urban areas—making it difficult to co-locate renewable power generation with fueling stations.

To address this issue, staff proposes to allow renewable power generated in the same balancing authority as the ZEV load to be used in EV charging and H_2 production. Staff's goal is to incent the installation of additional low carbon electricity supply coupled with additional ZEV fueling infrastructure. Staff modelled these amendments off the existing flexibility for renewable natural gas used in natural gas vehicles—the main other alternative fuel that requires new fueling infrastructure.

Additionally, staff is proposing an option to recognize and reward the GHG benefits of shifting EV charging and electrolytic hydrogen load to the periods of time when intermittent renewable electricity might otherwise be wasted (curtailed). These amendments would allow the LCFS to increase its effectiveness as a tool for promoting the integration of renewable power and ZEV-related load and help make these vehicles truly "zero emission" on a life cycle basis.

These amendments are intended to promote the expansion of zero-emission vehicle infrastructure through the Low Carbon Fuel Standard Program as directed by Executive Order B-48-18.

Improve Crediting for Innovative Actions at Conventional Fuel Refineries

The 2015 LCFS rulemaking introduced a pilot program for crediting conventional petroleum refineries for GHG reduction projects performed within the boundary of the refinery. The current Refinery Investment Credit Pilot Program (RICPP) allows refineries to generate credits for projects that reduce refinery greenhouse gas (GHG) emissions by at least 0.1 grams carbon dioxide equivalent per mega joule (gCO_2e/MJ), calculated based on pre- and post-project GHG emissions at the refinery level. To date the LCFS program has not issued any credits under this provision, in part due to the uncertainty of the eligibility threshold and credit calculation using the refinery's entire emissions, which fluctuate due to confounding factors beyond the impacts of the project in question.

Staff is proposing to make changes to the RICPP with the goals of: (1) focusing the provision on innovative changes at refineries, (2) simplifying the eligibility threshold and credit calculation method by focusing on project-level rather than refinery-wide emission changes.[2] Example of innovative projects that would be eligible under the proposed amendments include carbon capture and sequestration, the use of renewable electricity, fossil fuel substitution by renewable fuels for process energy, and electrification. Focusing this provision on innovative technologies would align it with the more successful provision for crediting production of crude using innovative methods and the overall technology-advancement goals at the core of the LCFS.

Relative to the current provision, these amendments would clearly signal the types of technological changes CARB would like to see the conventional petroleum refineries adopt. Simultaneously it would make the eligibility threshold more achievable, easier to estimate, and equitable to all refineries.

[2] Staff is proposing a new eligibility threshold whereby the GHG reduction in project lifecycle emissions would need to be at least one percent of to the pre-project on-site refinery level GHG emissions.

Addition of Third-party Verification

A successful GHG reduction program requires a system to monitor, report, and verify GHG emissions to support implementation and tracking of the effectiveness of emission reduction strategies. To date, the LCFS has relied upon a robust reporting program that includes CARB staff evaluation of fuel CI during the fuel pathway application process and random sampling for the reporting of quarterly fuel quantities per fuel pathway. Staff is now proposing supplementing the work of CARB staff with a verification system that would include independent third parties contracted by entities regulated under the LCFS. Conceptually, LCFS verifiers would perform GHG accounting checks in a role similar to the independent, objective evaluations of organizations' financial reports by financial auditors.

Pathway Application and CI Determination

Staff is proposing changes to the CI pathway application and certification process to better integrate with the system for third-party verification discussed above. Staff expects these changes would reduce application preparation time by the applicant as well as evaluation and processing time by the Board's staff. Our goal is to enhance transparency and simplicity of CI calculations while ensuring accuracy of raw data inputs and basic pathway information through independent third-party verification.

Adjust ADF Biodiesel in-use NOx Mitigation Sunset to Ensure Long Term NOx Mitigation

On July 15, 2013, the State of California Court of Appeal, Fifth Appellate District (Court) issued an opinion in *POET, LLC versus California Air Resources Board* (2013) 218 Cal.App.4th 681. The Court held that CARB needed to remedy California Environmental Quality Act (CEQA) and Administrative Procedure Act (APA) issues relating to the adoption of the original LCFS, including concerns about CARB's analysis of the environmental impacts of biodiesel.

CARB readopted the LCFS in 2015 to address the Court's concerns. At the same hearing, the Board also adopted the ADF regulation. The ADF regulation imposed restrictions to prevent certain biodiesels, which LCFS might incent, from causing any significant new NOx emissions. A 2017 Court of Appeal opinion concluded that CARB, in the 2015 re-adoption, had failed to adequately analyze potential NOx impacts that may have been caused by increased use of biodiesel driven by the LCFS. On October 18, 2017, the Superior Court issued a writ of mandate pursuant to the direction of the Court of Appeal.

In response to this writ of mandate, CARB set aside the portions of the 2015 LCFS environmental analysis addressing NOx emissions from biodiesel on November 17, 2017, and has developed a supplemental environmental analysis to the 2015 Environmental Analysis to more comprehensively address potential LCFS-driven biodiesel NOx

emissions impacts. A draft of that supplemental analysis is included as Appendix G to this ISOR.

Based on this updated analysis, staff proposes to add an additional requirement to the sunset provision of the ADF regulation such that the ADF sunset would not occur for biodiesel until the hours of operation of off-road New Technology Diesel Engines (NTDEs) are 90 percent of the total hours of operation of off-road diesel engines. This is in addition to the current provision requiring 90 percent of vehicle miles travelled by on-road heavy duty diesel vehicles to be from on-road heavy duty NTDEs.

Summary of Proposed Amendments

Table 2 provides a summary of the proposed changes to the regulation. Staff began conceptually discussing many of these items during an informal public process initiated in March of 2016, hosting 22 workshops and fuel-specific working meetings through December of 2017.

Table 2: Summary of Proposed Regulatory Amendments to the LCFS Regulation

Topic	Proposed Regulatory Updates
General	• Definition updates and additions, as needed • Improve consistency and clarity in referring to specific entities affected by the regulation and the types of data reports • Ensure accuracy and support better accounting through addition of recordkeeping and reporting requirements • Minor updates for typographical errors, clarifications, and organization of the rule, that do not materially affect requirements
Compliance, Program Targets & Credit Generation	• Strengthen the targets through 2030: revise benchmarks for gasoline, diesel, and jet fuel substitutes from 2019 to 2030 • Add new credit generating fuels and vehicle categories to incent further reductions, including alternative jet fuels • Adopt accounting and permanence protocols to enable credit generation for carbon capture and sequestration projects • Establish a Buffer Account to mitigate risk of credit invalidation • Shift credit generation to the end of each quarter and require business partner reconciliation in order to limit the scope of verification
Entities and Eligibility	• Enable trading exchanges to participate in the LCFS market to facilitate investment in new credit-generating projects and alternative fuels production • Enable account holders to designate a representative to manage fuel transactions reporting and credit transfers • Modify eligibility to provide flexibility while further clarifying the responsibilities of program participants

Fuel Pathways Applications and CI Determination	• Integrate third-party validation step into the certification process • Update LCA modeling tools and eliminate need for most producers to have familiarity with the CA-GREET model • Add new Lookup Table pathways, allow for updates to electricity pathways • Expand flexibility to recognize GHG benefits of low-CI electricity coupled with ZEV fueling infrastructure • Add ongoing responsibilities for submittal of Fuel Pathway Reports to ensure CI conformance • Extend the time period over which conformance with a certified CI score is evaluated • Add a process for innovative pathways to be evaluated before operation commencement • Reorganize text to improve readability
Fuel Transactions Reporting and Data Management	• Limit period of time that fuel can be transferred with credits/deficits attached • Add Verification Portal to the data management system for verifiers to have access to relevant applicant information • Require Fueling Supply Equipment registration for some fuels to avoid potential double counting of transactions reported at a distributed level • Further clarify requirements for reporting fuel exports
Petroleum and Project-based Credits	• Update Crude Oil Lookup Table • Improve accounting mechanisms for refinery hydrogen and investment credit pilot projects • Expand steam quality ranges for solar steam to improve accuracy of innovative crude crediting provisions
Verification Program	• Change reporting responsibilities for fuel transactions, CI data, and projects to integrate a system for verification by accredited third-parties and the Board's staff • Identify entities responsible for reporting and recordkeeping to enable verification • Establish requirements for verification process, including: frequency and deadlines for verification; verification body selection and rotation requirements; requirements for site visits, sampling plans, data checks, assessing conformance and material misstatement, and completion of verification services. • Establish accreditation requirements for third parties providing verification services • Require demonstration to CARB of no conflict of interest

CARB anticipates that the proposed amendments would have the following general benefits to California businesses and individuals:

- **Reduced GHG emissions.** The LCFS is specifically designed to reduce GHG emissions in the transportation sector, which is responsible for nearly half of

GHG emissions in California. This would contribute to California's efforts to address climate change. Cumulatively, from 2019 through 2030, staff expects the proposed amendments to achieve 70 MMT CO_2e additional GHG reductions beyond a business-as-usual scenario in which the current regulation is not amended.

- **Increased use of lower CI alternative fuels** and alternative fueled vehicles including biodiesel, renewable diesel, renewable jet fuel, low NO_X natural gas trucks, and electric and hydrogen zero emission vehicles. In addition to reducing GHG emissions, these fuels often lower levels of localized air pollutants, which are the cause of many deleterious health effects on California residents. As modeled, the proposed amendments would reduce total statewide $PM_{2.5}$ and NO_X emissions in each year from 2019 through 2030, resulting in health benefits for individuals in California of approximately 100 avoided premature deaths as compared to the business-as-usual scenario.

- **Greater opportunities for California businesses to invest** in the production of alternative fuels and other credit generating opportunities at oil fields and refineries.

- **Reduced dependence on fossil fuel and crude oil imports** and diversification of the transportation fuel pool, which may decrease the exposure of California to large swings in energy prices due to external economic shocks.

Some of these benefits are beyond the scope of staff's analysis in this rulemaking, but some studies suggest they are significant.[3,4,5,6,7]

Comparable Federal Regulations:

There are no current federal regulations comparable to the proposed regulation. The United States Environmental Protection Agency (U.S. EPA) has adopted Renewable Fuel Standard (RFS) regulations, 40 CFR §80.1400 et seq., that mandate the blending of specific volumes of renewable fuels into gasoline and diesel sold in the U.S. to achieve a specified ratio for each year (i.e., the renewable fuel standard). As defined,

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[3] California Energy Commission, Petroleum Market Advisory Committee, September 2017, http://docketpublic.energy.ca.gov/PublicDocuments/15-PMAC-01/TN221306_20170925T092536_Petroleum_Market_Advisory_Committee_Final_Report.pdf

[4] National Research Council, Transitions to Alternative Vehicles and Fuels. (2013) National Academy of Sciences. http://www.nap.edu/catalog.php?record_id=18264

[5] Fine, J., et al. The upside hedge value of California's global warming policy given uncertain future oil prices. Energy Policy (2012) doi 10.1016/j.enpol.2012.01.010

[6] Greene, D.L., Roderick, S.L., Hopson, J.L. OPEC and the Costs to the U.S. Economy of Oil Dependence: 1970-2010, (2013) Howard H. Baker Jr. Center for Public Policy.

[7] Greene, D.L., Tishchishyna, N.I. Costs of Oil Dependence: A 2010 Update. (2000) Oak Ridge National Laboratory.

"renewable fuels" under the RFS superficially resembles the list of transportation fuels subject to the LCFS.[8] However, there are a number of reasons why the RFS is not comparable to the LCFS.

Congress adopted a renewable fuel standard in 2005 and strengthened it in December 2007 as part of the Energy Independence and Security Act. The RFS requires that 36 billion gallons of biofuels be sold annually by 2022, of which 21 billion gallons must be "advanced" biofuels and the other 15 billion gallons can be corn ethanol. The advanced biofuels are those that achieve at least 50 percent reduction from baseline lifecycle GHG emissions, with a subcategory required to meet a 60 percent reduction target. These reduction targets are based on lifecycle emissions, including emissions from land use changes.

The RFS volumetric mandate alone will not achieve the objectives of the LCFS. The RFS targets only biofuels and not other alternatives; therefore, the potential value of electricity, hydrogen, and natural gas are not considered in an overall program to reduce the carbon intensity of transportation fuels. In addition, the targets of 50 percent and 60 percent GHG reductions only establish minimum requirements for biofuels, without incentivizing continuous improvements. Instead, the RFS assigns biofuels into four categories, without incentivizing innovations within any category. Finally, it does not apply to certain corn ethanol production plants, thus providing no incentive for reducing the carbon intensity from their fuels.

By contrast, the LCFS regulates all transportation fuels, including biofuels and non-biofuels, with a few narrow and specific exceptions. Thus, non-biofuels such as compressed natural gas, electricity, and hydrogen may play important roles in the LCFS program. In addition, the LCFS encourages much greater innovation than the federal program by providing important incentives to continuously improve the carbon intensity of biofuels and to deploy other fuels with very low carbon intensities.

If California were to rely solely on the RFS (i.e., the "No LCFS" alternative), the State would neither achieve the fuel carbon intensity goals, nor stimulate the innovation needed to support future dramatic GHG reductions from the transportation sector.

Because of these differences, the federal RFS regulatory program is complementary but not comparable to the LCFS.

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[8] 40 CFR §80.1101(d)(1) and (2) provide the following definitions:
"(1) Renewable fuel is any motor vehicle fuel that is used to replace or reduce the quantity of fossil fuel present in a fuel mixture used to fuel a motor vehicle, and is produced from any of the following: (i) Grain; (ii) Starch; (iii) Oilseeds; (iv) Vegetable, animal, or fish materials including fats, greases, and oils; (v) Sugarcane; (vi) Sugar beets; (vii) Sugar components; (viii) Tobacco; (ix) Potatoes; (x) Other biomass; (xi) Natural gas produced from a biogas source, including a landfill, sewage waste treatment plant, feedlot, or other place where there is decaying organic material.

(2) The term 'Renewable fuel' includes cellulosic biomass ethanol, waste derived ethanol, biodiesel (mono-alkyl ester), non-ester renewable diesel, and blending components derived from renewable fuel."

An Evaluation of Inconsistency or Incompatibility with Existing State Regulations (Gov. Code, § 11346.5, subd. (a)(3)(D)):

During the process of developing the proposed regulatory action, CARB conducted a search of any similar regulations on this topic and concluded these regulations are neither inconsistent nor incompatible with existing state regulations.

DISCLOSURE REGARDING THE PROPOSED REGULATION

The determinations of the Board's Executive Officer concerning the costs or savings incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulatory action are presented below.

Fiscal Impact/Local Mandate Determination Regarding the Proposed Action (Gov. Code, § 11346.5, subds. (a)(5)&(6)):

Under Government Code sections 11346.5, subdivision (a)(5) and 11346.5, subdivision (a)(6), the Executive Officer has determined that the proposed regulatory action would not create costs or savings in federal funding to the State, nor impose any mandate to the State, nor any local agency or school district, whether or not reimbursable by the State under Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

The proposed amendments could affect State and local governments finance through changes in taxes collected from fuel sales, changes in fuel expenditures for governments' fleets, cost-savings from reduced health impacts and changes of revenues from the sale of LCFS credits generated by local governments.

The proposed LCFS amendments are expected to lead to overall increases in the tax revenues generated from fuel sales for both the State and local governments, mainly due to higher gasoline and diesel prices resulting from the proposed amendments. However in 2019 to 2022, tax revenues from fuel sales are expected to decrease due to lower gasoline and diesel prices relative to business-as-usual, which result from the smoothing the CI schedule in this period. Overall, from 2019 to 2030, the proposed amendments are expected to increase State and local governments' tax revenues by $377 million and $512 million, respectively.

The change in fuel prices could also affect State and local governments' finances by changing the fuel expenditures of State and local fleets. By 2030, it is expected that the State fleet fuel expenditure could increase by $8 million and the local governments' fleet fuel expenditure could increase by $37 million.

The proposed amendments are also expected to result in health benefits due to improved air quality. These health benefits are expected to lead to cost-savings due to decreased hospital and emergency room visits, and reduced sick days for state and local government employees.

The proposed amendments are also expected to increase the revenues generated by local governments from the sale of LCFS credits generated primarily from the use of low-CI fuels in public transit systems. The proposed amendments are expected to increase local governments' revenues from the sale of LCFS credits by $802 million from 2019 to 2030. However, some of the increased revenues from selling LCFS credits may be used to purchase more expensive low-CI fuels or as an investment in fueling infrastructure or equipment to utilize these low-CI fuels.

Housing Costs (Gov. Code, § 11346.5, subd. (a)(12)):

The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

Significant Statewide Adverse Economic Impact Directly Affecting Business, Including Ability to Compete (Gov. Code, §§ 11346.3, subd. (a), 11346.5, subd. (a)(7), 11346.5, subd. (a)(8)):

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

MAJOR REGULATION: Statement of the Results of the Standardized Regulatory Impact Analysis (SRIA) (Gov. Code, § 11346.3 (subd. (c), 11346.5(a)(10)):

In November 2017, CARB submitted a Standardized Regulatory Impact Assessment to the Department of Finance (DOF) for their review. To determine the economic impacts of the regulation, CARB modeled the impact of the LCFS proposed amendments on the California economy. The economic impacts have minor negative net impacts on macroeconomic indicators. The economic modeling results show that the low carbon fuel producing sectors of the economy gain from implementing the proposed amendments at the expense of high carbon fuel producing sectors.

CARB has revised the SRIA based on modifications included in the proposed regulatory action since the original SRIA submittal, and to address DOF comments. The revised SRIA is included as Appendix E of the Initial Statement of Reasons (ISOR or Staff Report). The results of the updated macroeconomic modeling are not significantly different from the original SRIA submitted to the DOF.

(A) The creation or elimination of jobs within the state.

The proposed amendments are anticipated to result in growth in total employment from 2019 through 2024 as demand increases for the services of secondary industries such as construction, and expansion of low carbon fuel production facilities and third-party verification services. Slowing of employment growth, relative to the baseline, begins in 2027 as the employment benefits of the proposed amendments are offset by the

employment impacts on conventional high carbon fuel producers (and the employers that use these fossil fuels) and as the CI reduction targets become more ambitious through 2030.

(B) The creation of new businesses or the elimination of existing businesses within the state.

The proposed amendments are expected to provide substantial incentive to low-CI fuel producers, spurring existing businesses to grow and new businesses to be created to meet the expanding demand for these fuels. While the proposed amendments do not guarantee the creation of in-state jobs, as the LCFS is neutral to the location of production, many California businesses currently produce low-CI fuels that are incentivized by the LCFS, and as the demand for these fuels increase it is likely that the number of businesses in California that produce low-CI fuels will increase.

(C) The competitive advantages or disadvantages for businesses currently doing business within the state.

The proposed amendments are designed to increase the competitiveness of low-CI fuels in California, therefore, California businesses that produce low-CI fuels may become more competitive. Petroleum fuel producers, however, may be negatively impacted by the proposed amendments.

California sectors that rely heavily on transportation fuel may also face higher prices, resulting in a competitive disadvantage relative to out of state entities that are not subject to the LCFS. However, due to the 2015 Paris Agreement reached by the Conference of Parties in Paris, which is aimed at keeping the global temperature rise below 2°C, CARB expects signatories (which include all of the U.S.'s trading partners) to take action to reduce GHG emissions. As these policies come online, businesses outside of the state will begin to face similar carbon costs in order to reduce GHGs, reducing the relative impact of the proposed amendments on California businesses.

Low carbon fuel mandates similar to California's LCFS have been adopted by the U.S. EPA and by other jurisdictions including Oregon, British Columbia, the European Union, and the United Kingdom. Canada has also proposed a Federal Clean Fuel Standard to help achieve its 2030 GHG target.

(D) The increase or decrease of investment in the state.

The proposed amendments would likely have small impacts on private investment growth, resulting in less than a one percent change in private investment growth relative to the baseline. The modeling results suggest a slight increase of investment growth from 2019 through 2024, likely driven by increased demand in secondary industries and from credit revenue generated in early years. This is followed by a slight slowing of investment growth from 2026 through 2030, likely driven by increases in fuel prices as deficit generation occurs across conventional fuel producing industries.

(E) The incentives for innovation in products, materials, or processes.

The proposed amendments would lead to an overall higher price for LCFS credits relative to the baseline, which would send a signal for research and development, and deployment of innovative technologies and fuels that support California's long-term GHG emissions reduction goals. All fuel producers would have an increased incentive to innovate and deploy new methods that reduce the CI of their fuels. The proposed amendments would additionally provide long term policy certainty, which is essential for low-CI fuel producers to make investments in long-term capital projects and research and development. Additionally, the proposed amendments include a protocol that would facilitate LCFS crediting for CCS projects, a technology area with a high potential for innovation and development.

(F) The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency.

CARB anticipates that the proposed amendments would have the following general benefits to California businesses and individuals:

- Reduced GHG emissions. The LCFS is specifically designed to reduce GHG emissions in the transportation sector, which is responsible for nearly half of GHG emissions in California. This would contribute to California's efforts to achieve its mid- and long-term climate goals. By incentivizing the development and adoption of innovative low carbon fuels, the more aggressive targets would facilitate greater reductions in the future. Cumulatively from 2019 through 2030, the proposed amendments provide an additional 117 MMT emission reductions as compared to the current conditions baseline and an additional 70 MMT emission reductions as compared to the business-as-usual scenario.

- Reduced criteria pollutant and toxic air contaminant emissions. Increased use of lower CI alternative fuels and alternative fueled vehicles including biodiesel, renewable diesel, renewable jet fuel, low NO_X natural gas trucks, and electric and hydrogen zero emission vehicles. In addition to reducing GHG emissions, this may lower levels of localized air pollutants, which are the cause of many deleterious health effects on California residents.

- Greater opportunities for California businesses to invest in the production of alternative fuels and other credit generating opportunities at oil fields and refineries. The proposed amendments would increase the demand for low carbon fuels, which provides an opportunity for businesses both in-state and out-of-state, to increase revenue from the sale of low carbon fuels in California. The proposed amendments may also lead to a higher long-run price for LCFS credits relative to business-as-usual, which would signal for research and development, and deployment of innovative technologies and fuels that support California's long-term GHG emissions reduction goals.

- Reduced dependence on fossil fuels. The LCFS increases the cost of fossil fuels relative to low-carbon fuel options, such as electric vehicles, renewable diesel, and biomethane. As low-carbon, non-conventional fuels become lower-cost fuel options, demand for fossil fuels would be reduced.

(G) Department of Finance Comments and Responses.

1. **DOF Comment:** The SRIA baseline incorrectly assumes the continuation of certain policies through 2030 rather than requirements established in statute or regulation, which leads to an underestimate of the cost of complying with the proposed regulation. In particular, federal renewable fuel subsidies are currently worth around 1.5 billion annually. Costs would be higher if they are not assumed to continue through 2030. Federal fuel economy standards are also assumed to be held constant past 2025. These assumptions support the 35% reduction in transportation fuel demand in the baseline, which would be an overestimate of the reduction under current policies.

Federal Renewable Fuel Standard: The federal renewable fuel standard does not expire or sunset in 2022. Instead, U.S. EPA has authority to set volume requirements after 2022 in coordination with the Secretary of Energy and the Secretary of Agriculture. In any given year, U.S. EPA may waive the existing federal volume obligations defined in statue through 2022, based on a determination that the statutory volume obligation poses substantial economic risk, or if the supply of renewable fuel is inadequate to comply with the standard. The U.S. EPA has used this waiver authority, and since 2014 RFS volumes have substantially deviated from the statutory volumes. In this way, in practice the statutorily defined volumes have become more similar to guidance for maximum renewable obligations than a mandatory minimum. For volumes after 2022, it is uncertain whether the renewable fuel standard will increase or decrease in stringency.

Given the cost and time it takes to invest in the necessary infrastructure to bring renewable fuels to market, it is unlikely that there will be a sudden downward shift in fuel volume requirements after 2022 due to the likelihood of stranded assets including ethanol and biodiesel production facilities and blending terminals, and the political constituencies such as the agriculture industry that would be put at risk. A multi-year stakeholder process beyond what is legally required to revise volume obligations would therefore be more likely, ultimately resulting in a gradual shift in the standard. However, if additional low-carbon renewable technologies manifest in the interim that make compliance with the standard more amenable, it is possible that the standard may be strengthened or expanded to better capture these considerations (e.g., the standard could expand to better account for possible electric vehicle pathways).

Even in the event that no volume obligations are set after 2022, there will still be existing renewable fuel assets that can provide fuel production volumes at substantially lower marginal cost than the cost of building new fuel production facilities or infrastructure to support low-carbon fuel pathways including that required to support zero emission vehicles. Reducing the federal fuel volume targets after 2022 would

result in decreased domestic demand for renewable fuel, and therefore the remaining fuel production would shift to volumes produced at lower marginal cost. It is therefore possible that the incentive provided by the proposed LCFS amendments would motivate sufficient volumes of low carbon fuel to be produced and enter into the California market without needing strong federal renewable fuel volume requirements. Additionally, there are some fuels that would be more likely to come to California in the event that the RFS volume obligations disappear, such as landfill gas, which is eligible for credit generation under the LCFS for fuel pathways like refinery investment projects that are not currently credited under the RFS. Therefore, landfill gas could be more likely to enter California where it could receive LCFS credit, relative to current conditions under which use in vehicle fleets outside of California currently receives considerable credit under the RFS.

Because there is great uncertainty with how the Renewable Fuel Standard may change after 2022, and the additional uncertainty in how this would impact California fuel supply, staff does not believe there is a more supportable assumption post-2022. The costs and supply variability provided across scenarios yields estimates and ranges that can account for the uncertainty in the post-2022 RFS.

CAFE Standards: The fuel demand model used in the main scenario assumes that the CAFE standards are held constant after 2025. It is possible that the standard may be revised downward, or that backsliding may occur. It is also possible that personal mobility trends in California will not shift, and that per capita reductions in Vehicle Miles Traveled will not occur. To account for these uncertainties, CARB has proposed a High Light-Duty Vehicle Demand Sensitivity in Appendix H of the SRIA. In this high-demand scenario, CARB assumed that light duty vehicle (LDV) fuel demand will decline 15 percent by 2030 (from 2016 levels). As per DOF's comments, CARB has updated scenarios to better reflect the demand forecast from the California Energy Commission (CEC), which includes an 11 percent reduction in gasoline from 2016 levels by 2030, and a 2 percent increase in diesel from 2016 levels by 2030.

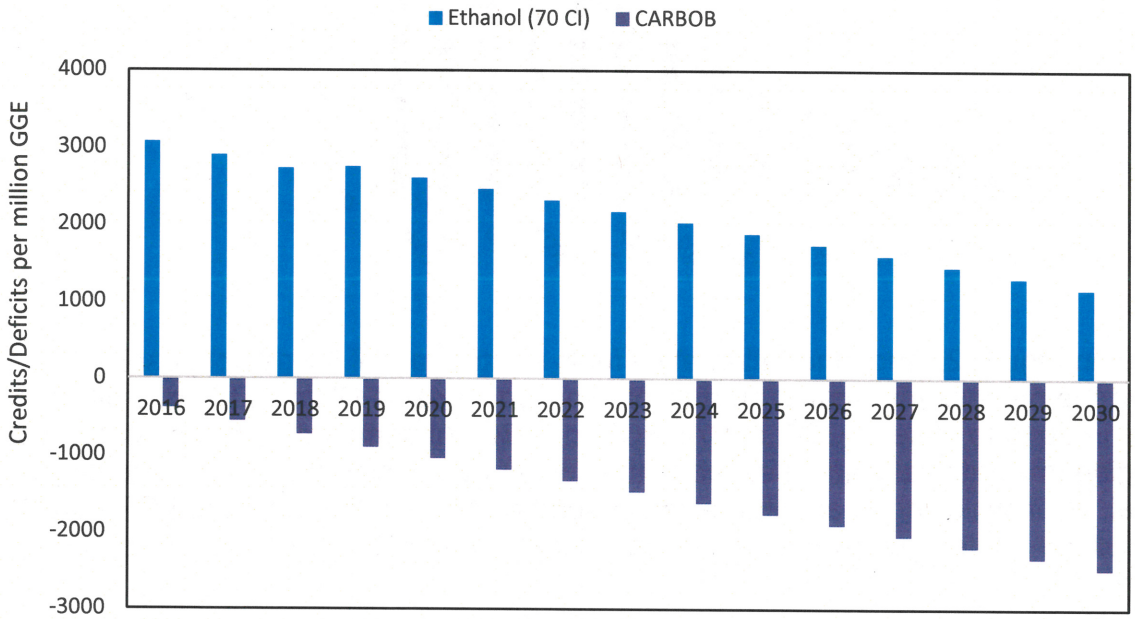
This higher LDV fuel demand in the CEC-demand scenario would lead to higher deficit generation, and therefore higher demand for credits to comply with the LCFS. In the later years, additional deficits that are generated could be offset by using additional renewable diesel and alternative jet fuel, the lowest marginal cost fuels. Additional supply of these fuels is likely to be available at credit prices between $150 and $175, which should be sufficient to offset any deficits that occur in the CEC-demand scenario.

2. **DOF Comment:** The SRIA must explain how carbon intensity connects with supply and demand of alternative fuels, and how those quantities connect with credits. Currently, the discussion jumps from carbon intensity measured in percentage reduction from a 2010 baseline to alternative fuel volumes to credits generated to prices of credits. The reader must be able to account for the impacts of carbon intensity from the mechanisms of supply and demand described in the SRIA.

Each year the Average Fuel Carbon Intensity required by the LCFS for fuel used in California changes. This change results in greater deficits being generated by

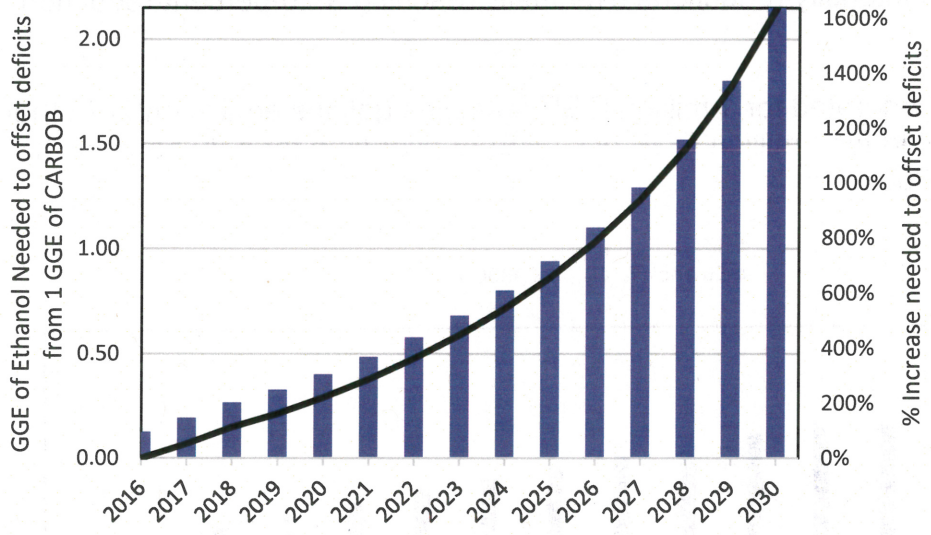
conventional higher CI fuels (gasoline and diesel), and fewer credits being generated by low-carbon fuels. Figure 1 shows how LCFS credit and deficit generation changes for one gallon of gasoline equivalent of ethanol and CARBOB over time at constant increases in carbon intensity reductions eventually reaching a 20-percent-reduction target in 2030.

Figure 1. Credits generated for 1 million GGE (gasoline gallons equivalent) of Ethanol and deficits generated for 1 million GGE of CARBOB over time for a 20 percent-CI-reduction target in 2030.



As shown in Figure 1, if a single low-carbon fuel is used to decarbonize the transportation system, an ever-increasing volume of that fuel would be necessary over time to cover the increasing number of deficits being generated. Due to the flexibility of the program, compliance may be met by increasing low CI fuel volumes, decreasing carbon intensity through process improvements, or substituting lower CI fuels. Figure 2 shows what could happen to volumes and relative costs in the event that no process improvements or fuel substitutions are made.

Figure 2. Quantity of ethanol (70 gCO_2e/MJ) needed to offset deficits from 1 GGE of CARBOB (which changes from 99.78 to 101.43 gCO_2e/MJ in 2019) over time due to an escalating Carbon Intensity reduction requirement.



As seen in Figure 2, if no other alternative fuels existed, and if it was not possible to improve the process for ethanol production, you would need 17 times the quantity of ethanol in 2016 to offset 1 GGE of CARBOB in 2030. At some point, however, the cost of bringing in additional volume exceeds the cost of decreasing the carbon intensity of that fuel, or of switching to an alternative low-carbon fuel. In this way, the LCFS credit price and the related supply of any alternative fuel is set by the least cost option for compliance.

Because there is considerable uncertainty related to: 1) the level of decarbonization that is possible with existing low-carbon fuel supplies, 2) the cost of producing additional volume of existing fuel supplies, and 3) the cost of bringing new fuels to the California market, it is difficult to ascertain the cost of compliance and the likely fuel supply for a given year. To better piece this out, CARB has used techno-economic models, which look at the supply curves for a variety of different technology pathways, and build supply projections based on the lowest-cost option for generating additional credits under the program. This allows total fuel supply to translate to LCFS credit prices, which can be used to assess the cost of compliance with the standard.

For any regulated party, compliance with the LCFS will be based on decisions to procure new low-carbon fuel volumes, to procure credits from the market, or to reduce the amount of fuel that is sold with a carbon intensity above the standard. For instance, for a regulated party selling 1 million gallons of CARBOB, there would be a deficit burden of 745 deficits in 2018 (CARBOB has a CI of 99.78 gCO_2e/MJ, and the standard in 2018 is 93.55 gCO_2e/MJ). At blend levels of 10 percent ethanol by volume, this would allow approximately 111 thousand gallons of ethanol to be blended, which, with a hypothetical carbon intensity of 70 gCO_2e/MJ, would generate approximately 213 credits in 2018. The remaining 532 deficits could be offset by procuring approximately 72 thousand gallons of renewable diesel at a carbon intensity of 40 gCO_2e/MJ.

Alternatively, if the lowest cost option for compliance were to use credits to offset the remaining deficit, 532 credits could be purchased for compliance. At a price of around $125 per credit, this would add approximately 6 cents per gallon of E10 fuel in 2018. Alternatively, the credits might also be generated to displace the remaining deficits through other fuel pathways, like electric vehicle charging. Charging approximately 190 electric vehicles that each travel around 11,000 miles per year would likely be sufficient to offset the remaining deficits from 1 million gallons of CARBOB.

Business Report (Gov. Code, §§ 11346.5, subd. (a)(11); 11346.3, subd. (d)):

In accordance with Government Code sections 11346.5, subdivisions (a)(11) and 11346.3, subdivision (d), the Executive Officer finds the reporting requirements of the proposed regulatory action which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

Cost Impacts on Representative Private Persons or Businesses (Gov. Code, § 11346.5, subd. (a)(9)):

In developing this regulatory proposal, CARB staff evaluated the potential economic impacts on representative private persons or businesses.

The proposed amendments are expected to indirectly impact private persons through changes in fuel prices, which would be an ongoing cost or benefit. Therefore, the potential impact of the proposed amendments on private persons depends on how much and what type of transportation fuel those persons use. Assuming that the representative individual in California travels about 12,000 miles annually in a gasoline vehicle, the incurred additional cost due to the proposed amendments will depend on the individual vehicle's fuel economy. The table below summarizes the estimated annual increase in fuel cost for a typical individual in 2030 based on vehicles with different average fuel economies.

25 mpg	30 mpg	35 mpg	40 mpg	45 mpg	50 mpg
$134	$112	$96	$84	$75	$67

Conversely, individuals who drive an alternative fueled vehicle (e.g. electric vehicle, fuel cell vehicle, natural gas fueled vehicle, etc.) may experience a decrease in fuel cost if the value of LCFS credit for these lower CI fuels is passed on to the consumer.

Businesses involved in the LCFS vary greatly by size, geographic location, and even by industry, and there is no easily defined typical business. However, CARB staff expects the costs of complying with proposed amendments would fall initially on oil refineries, which are anticipated to pass these costs to consumers of high carbon conventional fuels, such as gasoline and diesel. By 2030, it is expected that the typical California refinery would incur an additional cost of $307 million due to the proposed amendments.

Effect on Small Business (Cal. Code Regs., tit. 1, § 4, subds. (a) and (b)):

The Executive Officer has also determined under California Code of Regulations, title 1, section 4, that the proposed regulatory action would affect small businesses.

All small businesses in California that are directly participating in the LCFS are low-CI fuel producers and would benefit from the proposed amendments. The proposed amendments are expected to increase the demand for their products and increase the price of the LCFS credits, resulting in higher revenue for these small businesses. Although the addition of the LCFS verification requirement would likely increase the cost for some small businesses, the increases in cost due to verification would likely be recovered through the revenues earned by the sale of LCFS credits. Biodiesel producers who are small businesses and incur costs from the proposed amendments to the ADF regulation (e.g. blending biodiesel with renewable diesel or with additives) are expected to either pass those costs on to consumers or, if they are unable to pass costs on, they may receive less benefit from LCFS credits.

The proposed amendments would also indirectly affect small businesses that do not participate in the LCFS. As described above, the proposed LCFS amendments are likely to have an ongoing impact on the price of petroleum-based transportation fuels. This would indirectly affect businesses that use transportation fuels. For example, if a small business has a vehicle fleet that travels 100,000 miles annually and achieves an average fuel economy of 25 miles per gallon, that business would consume 4,000 gallons of petroleum-derived fuel a year. In 2030, the potential cost impact of the petroleum-derived fuel (diesel) is estimated as 18-36 cents/gallon, resulting in a potential cost impact of $720 to $1,440. Small businesses using low-carbon fuels, including electricity, hydrogen, natural gas, and blends of low-carbon and petroleum-based fuels, could see reduced costs depending on the flow of the credit value from low-CI fuel producers to consumers.

Alternatives Statement (Gov. Code, § 11346.5, subd. (a)(13)):

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board (which includes during preliminary workshop activities), would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law.

The Executive Officer analyzed two alternatives to the proposed regulation: The first alternative is more aggressive than the proposed amendments and achieves a 25 percent CI reduction in 2030. Similar to the proposed amendments, the compliance trajectory for this alternative is smoothed by linearly reducing the benchmarks between the current 5 percent reduction in 2018 to a 25 percent reduction in 2030. The second alternative achieves an overall CI reduction target of 18 percent by 2030 but does not smooth the

compliance trajectory, instead maintaining the current compliance targets through 2022 and then decreases targets linearly to an 18 percent reduction in 2030.

The first alternative would achieve higher GHG reduction than the proposed amendments but at a significantly higher cost to the California economy and consumers. The cost effectiveness of this alternative is estimated to be nearly triple that of the proposed amendments.

The second alternative would result in similar GHG reduction as the proposed amendments but at a higher cost to the California economy and consumers. The cost effectiveness of the second alternative was estimated to be $174 per MT CO_2e as compared to $129 per MT CO_2e for the proposed amendments.

ENVIRONMENTAL ANALYSIS

CARB, as the lead agency for the LCFS Amendments, prepared a Draft Environmental Analysis (EA) in accordance with the requirements of its regulatory program certified by the Secretary of Natural Resources. (California Code of Regulation, title 17, sections 60006-60008; California Code of Regulation, title 14, section 15251, subdivision (d).) The Draft EA provides a programmatic environmental analysis of the reasonably foreseeable compliance responses that could result from implementation of the proposed LCFS Amendments.

The resource areas from the California Environmental Quality Act (CEQA) Guidelines Environmental Checklist were used as a framework for a programmatic environmental analysis of the direct and reasonably foreseeable indirect environmental impacts resulting from implementation of the proposed LCFS Amendments. The Draft EA provides an analysis of both the beneficial and adverse impacts and feasible mitigation measures for the reasonably foreseeable compliance responses associated with the recommended amendments.

The Draft EA concluded implementation of these proposed amendments could result in the following short-term and long-term beneficial and adverse impacts: beneficial impacts to energy demand and greenhouse gases; less-than-significant impacts to cultural resources, energy demand, greenhouse gases, hazards and hazardous materials, mineral resources, population employment, and housing, public services, and recreation; and potentially significant and unavoidable adverse impacts to aesthetics, agriculture and forest resources, air quality, biological resources, cultural resources, energy demand, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, transportation/traffic and utilities and service systems. The potentially significant and unavoidable adverse impacts are primarily related to short-term, construction-related activities. This explains why some resource areas are identified above as having both less-than-significant impacts and potentially significant impacts. Please refer to the Draft EA for further details.

The Draft EA is included as Appendix D to the ISOR and can be obtained from CARB's website at: http://www.arb.ca.gov/regact/2018/lcsf18/lcsf18.htm

SPECIAL ACCOMMODATION REQUEST

Consistent with California Government Code Section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language; and
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia;
- Documentos disponibles en un formato alterno u otro idioma; y
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envié un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California

AGENCY CONTACT PERSONS

Inquiries concerning the substance of the proposed regulatory action may be directed to the agency representative Sam Wade, Branch Chief, Transportation Fuels Branch, Industrial Strategies Division, at (916) 322-8263, or (designated back-up contact) Anthy Alexiades, Air Resources Engineer, Alternative Fuels Section, at (916) 324-0368

AVAILABILITY OF DOCUMENTS

CARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: Staff Report: Initial Statement of Reasons for the Proposed Amendments to the Low Carbon Fuel Standard and Alternative Diesel Fuels Regulations.

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strikeout format to allow for comparison with the existing regulations, may be accessed on CARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, beginning on March 6, 2018.

Further, the agency representative to whom nonsubstantive inquiries concerning the proposed administrative action may be directed is Bradley Bechtold, Regulations Coordinator, at (916) 322-6533. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Government Code, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

Following the public hearing, the Board may vote on a resolution directing the Executive Officer to: make any proposed modified regulatory language that is sufficiently related to the originally proposed text that the public was adequately placed on notice and that the regulatory language as modified could result from the proposed regulatory action, and any additional supporting documents and information, available to the public for a period of at least 15 days; consider written comments submitted during this period; and make any further modifications as may be appropriate in light of the comments received available for further public comment. The Board may also direct the Executive Officer to: evaluate all comments received during the public comment periods, including comments regarding the Draft Environmental Analysis, and prepare written responses to those comments; and present to the Board, at a subsequently scheduled public hearing, the final proposed regulatory language, staff's written responses to comments on the Draft Environmental Analysis, along with the Final Environmental Analysis for action.

FINAL STATEMENT OF REASONS AVAILABLITY

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on CARB's website listed below.

INTERNET ACCESS

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on CARB's website for this rulemaking at http://www.arb.ca.gov/regact/2018/lcfs18/lcfs18.htm

CALIFORNIA AIR RESOURCES BOARD

Richard W. Corey
Executive Officer

Date: February 20, 2018

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.